

AN EMPIRICAL DEFINITION OF "PRIMARY CARE"

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ABSTRACT: An operational definition of "primary care", useful to a wide variety of professionals, has eluded researchers since the term first gained popularity. This paper presents an activity-based definition of primary care derived from ratings of 59 representative health care activities by a group of state health administrators, a group of local health department directors, and a random sample of primary care physicians practicing in North Carolina. Thirty-one activities received ratings indicating they were considered core primary care services. Examination of differences in ratings among the three groups surveyed suggests that health department directors differ from the other two groups. Consideration of the variances of activity ratings within the groups emphasizes the unique response of the health department directors and identifies activities characterized by considerable disagreement.

The study includes information necessary for researchers and practitioners to form an activity-based definition of varying scope. Definitions constructed from this information should be useful in planning the evaluation efforts that involve different groups of providers, since activities provide an objective basis for agreement. Repeating the approach outlined in the paper with other provider groups in other areas of the country should lead to better understanding of intergroup and regional differences in the concept of "primary care".

The concept of "primary care" lies at the center of both governmental and private efforts to increase the accessibility of comprehensive health care. But in spite of the number and importance of these efforts, there is little agreement on an operational definition of primary care. For example, "primary care" can refer not only to the personnel delivering the medical care, to different forms of medical care practice, and to medical care activities, but also to ethical considerations and to various attributes of the entire medical care process. Despite the considerable attention given to "primary care", one never knows precisely what the term means.

Such confusion has a simultaneous advantage and disadvantage. On one hand it can facilitate agreement among various interest groups by obscuring their basic differences. Since the groups easily agree on the need for primary care, a term having different connotations for different people, the notion provides a mechanism for continuing dialogue among parties with

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conflicting philosophies. On the other hand, however, the confusion has given rise to dialogue that becomes a substitute for the real organizational change required in the health system. Indeed, the development and actual use of clearly defined terms is a fundamental step in resolving controversy, especially one involving complex issues of health care.¹

The objective of this paper is to present an empirically derived definition of "primary care" that can be useful to practitioners as well as to researchers. The definition is based on a list of health care activities judged by a sample of health care providers (primary care physicians, local health department directors, and state health department administrators) to be central to primary care. Areas of disagreement between and within these groups are also identified and discussed.

SETTING

North Carolina has a special need for a widely accepted, operational definition of primary care. Under a grant approved early in 1977 by the North Carolina General Assembly, 20 of the 83 public health departments in the state began receiving funds in June of that year for an experimental program to provide primary care through local public health departments. The specific services funded varied greatly by department, although all services were labeled "primary care".

The North Carolina Medical Society quickly opposed the program. The Society criticized the plans for the program on the basis of cost, program design, and planned use of nurse practitioners. It contended that the overall cost of the health department program would exceed that incurred by providing the services through the private sector. The Society also pointed out that the restriction of services to the normal health department operating hours was in direct contradiction to most normative definitions of primary care, which call for a 24-hour, continuous single source of care. Finally, it suggested that state guidelines and standards for the supervision of nurse practitioners were confusing and might lead these professionals into providing services in a manner currently illegal.

To resolve the conflict, the Governor appointed a special 25-member task force to study the program and the controversy surrounding it and to make recommendations that would lead to (1) improved communication among those delivering health care, (2) clarification of the roles of the public and private sectors, and (3) elimination of some gaps in the existing health care system.² The task force was composed of representatives from the state medical society, state health officials, and the representatives of local health departments. After several meetings it became obvious that the different groups, while all supporting the need for "primary care", based their discussions and decisions on different concepts of the term.

This ambiguity provided the impetus for developing an empirical definition of primary care. Health services research was concerned with identifying the specific activities that physicians, state health officials, and local health department personnel all define as primary care. The Governor's Task Force provided support for the study by encouraging the three groups to participate in a survey described in the methods section below.

PREVIOUS APPROACHES

Previous definitions of primary care have focused on activities or services, on attributes, on types of personnel, or on types of practice organizations. In addition, definitions have varied from the largely descriptive, representing what appears to be happening, to the more prescriptive, representing what ideally ought to happen. Although some definitions have been derived empirically, most have been authored by individuals or groups for their own purposes.

Among the empirical definitions, a study reported by Parker and associates is illustrative of attempts to define primary care in terms of activities of services.³ The authors used Nominal Group and modified Delphi procedures first to generate, and then to rate, statements concerning the functions of a provider of primary care.

Definitions based on attributes usually focus on the following four elements: continuity of care, coordination of services, comprehensive care, and family-centered care. For example, Holmes and associates employed an empirical approach in defining primary care in terms of those four elements or attributes.⁴ They investigated the extent to which "primary care" was performed in a manner consistent with the four elements, and whether or not the type of training family physicians received affected the level of performance in primary care.

Aiken and associates investigated primary care empirically with respect to the types of personnel providing the level of care.⁵ These authors described attributes of primary care in terms of continuity and comprehensiveness and found that "primary care" accounts for 20% to 72% of the patient encounters for physicians who label themselves specialists.

A number of groups and individuals have published their own definitions of primary care based on approaches other than the empirical. Inevitably, each definition reflects the role and priorities of individual or group authorship. Many of the definitions arrived at by other than empirical means attempt to be all-inclusive and contain references to activities, attributes, types of personnel, and types of practice organizations. For example, an ad hoc committee of the North American Primary Care Research Group has published a "Glossary for Primary Care", which includes a definition of primary care as well as definitions of over fifty words and terms commonly used to refer to different

aspects of primary care.⁶ Similarly, the Institute of Medicine of the National Academy of Sciences has published a primary care checklist that the authors claim can be used to determine whether or not a teaching clinic actually provides primary care.⁷

Still others have attempted to define primary care by comparing the concept to other terms, such as comprehensive medicine or ambulatory care.^{7,8} Tonkin considers primary care in terms of special functions performed by the primary care provider and in terms of facilities and types of primary care providers.⁹ Millis has defined primary care by including all health care not covered by “secondary” and “tertiary” care.¹⁰

Previous definitions have two principal problems. First, several appear to confuse attributes with services. Although the Institute of Medicine report stated that services, not the specialty of the provider, should form the basis of the definition, by far the majority of the items included in the checklist have to do with attributes (for example, continuity and accountability), while only a few concern actual services (such as transportation).

Second, previous definitions tend to be prescriptive, at least to some degree. Even the definition of Parker and associates, which was empirically derived, is prescriptive due to the nature of the statements used to describe primary care.

In order to avoid the “attributes versus services” and “prescriptive versus descriptive” limitations, this paper attempts to define primary care empirically in terms of the actual activities involved in the provision of care. It was thought that perhaps a central core of activities existed which all of the principal parties involved in the North Carolina situation—state and regional health administrators, local health department directors, and primary care physicians—considered primary care. Activities were thought to provide the most valid indication of agreement among disparate groups since activities are relatively well defined, discrete, and less value-laden.

METHOD

Sample. The three parties involved in the controversy over the state’s primary care program served as the study population. Twenty-one state and regional health administrators, identified as significantly involved in the development of the state program by the Assistant Director for Local Services in the State Division of Health Services, constituted one study group. Directors of all of the health departments in the state constituted a second group numbering 69 (although there are 83 health departments in North Carolina, a few directors service multiple departments, and some positions were vacant at the time of the study), and a random sample ($N = 100$) of primary care physicians* constituted the third group. The physicians practiced both in the

* Primary care physicians included those involved in the following specialties: general practice, internal medicine, obstetrics and gynecology, pediatrics, general surgery, and family medicine.

counties awarded funds for the experimental primary care program and in a group of matched control counties not awarded funds for the program. Eighty-one percent of the state and regional health administrators completed the survey instrument, as did 84% of the local health department directors and 48% of the primary care physicians. Approximately one third of the state and regional health administrators and of the local health department directors were themselves physicians.

Survey instrument. Careful review of state reports and plans concerning health department activities and consultation with physicians, people with experience in local public health departments, and persons familiar with statewide public health programs provided the basis for the development of a list of health services that could form part of primary care. This list was reduced to 59 representative services, which served as questionnaire items. The questionnaire requested the rating of each of the 59 activities on a five-point scale ranging from "definitely not primary care" to "definitely primary care". Respondents were asked to indicate specifically the degree to which they considered each of the activities central to their own definition of primary care. They were not asked whether these activities were performed by themselves or within the particular setting with which they were familiar.

RESULTS

Mean ratings. By assigning the five rating scale points integer values from "1" to "5" (where "1" corresponds to "definitely not primary care"), mean ratings for each activity by respondent group were calculated. They are displayed in Table 1. The 59 activities are ordered by the unweighted item grand means (i.e., the average of the three groups means) from the most definitely primary care activity through the most definitely not primary care activity.

By accepting the null hypothesis of no group differences (see the following section) we can interpret the item grand means as the three respondent groups' agreed-upon ratings of the activities. The activity ratings, of course, form a continuum, and therefore any decision about a "cut-off" point for services to be considered part of the provision of primary care is arbitrary. The ratings *do*, however, provide the information necessary for a service definition of primary care with whatever breadth or restrictiveness one desires. For example, it might be argued that only activities with mean ratings of 4.0 or greater (corresponding to the two most definitely primary care scale points) should be accepted as representing "primary care services". Such a decision would include 31 of the 59 activities as primary care.

Examination of these core activities reveals a number of clusters, which could be categorized as (a) patient examination, (b) laboratory procedures, and (c) treatment procedures. For example, taking patient history and examining

the soft tissues of the mouth would fall into the first category. Pregnancy testing, Pap smear, and blood tests for hematology would fall under the second, and therapeutic injections, ear irrigation, and prescribing medication would fall under the third.

Within each of these categories, it is instructive to compare the activities that fall within the definition of primary care (i.e., with a mean rating ≥ 4.0) with those that fall outside (i.e., with a mean rating ≤ 4.0). For example,

TABLE 1

Activity Rating Means and Variances by Respondent Group							
Activity	Grand X	Administrators		Directors		Physicians	
		X	δ^2	X	δ^2	X	δ^2
Therapeutic injection	4.62	4.71	0.97	4.50	0.82	4.65	0.57
Ear irrigation	4.54	4.69	0.36	4.43	0.64	4.50	0.85
Prescribing medication	4.54	4.35	1.62	4.62	0.49	4.64	0.89
Taking patient's history	4.52	4.82	0.28	4.00	1.82	4.72	0.38
Examination of the soft tissues of the mouth	4.48	4.63	0.78	4.28	1.29	4.54	0.64
Dressing a burn or wound	4.48	4.71	0.35	4.47	0.85	4.27	1.31
Lab blood test for hematology	4.48	4.76	0.44	4.17	1.86	4.50	1.14
Pap smear	4.47	4.71	0.60	4.12	1.93	4.58	0.97
Urinalysis	4.45	4.76	0.57	4.02	2.12	4.56	1.06
Pelvic examination	4.43	4.41	0.88	4.32	1.18	4.55	0.73
Immunization	4.39	4.76	0.32	3.89	2.67	4.52	0.89
Physical examination for entering school	4.36	4.47	1.39	4.14	1.98	4.46	1.06
Pregnancy testing	4.33	4.47	0.76	4.10	2.09	4.42	1.18
TB skin test	4.33	4.59	0.76	3.84	2.62	4.55	0.99
Routine obstetrics care	4.31	4.59	0.76	4.41	1.19	3.93	2.02
Patient counseling	4.31	4.69	1.03	3.84	2.24	4.40	1.03
Well baby care	4.31	4.53	1.14	3.88	2.36	4.51	0.78
Urine culture	4.29	4.71	0.35	3.95	2.16	4.23	1.54
Microscopic examination of urine	4.29	4.31	0.90	4.09	1.55	4.46	1.14
Breast examination as screening procedure	4.28	4.63	0.78	3.76	2.68	4.46	0.98
Testing vision	4.26	4.65	0.74	3.74	2.72*	4.39	1.09
Suture removal	4.21	4.29	1.22	4.05	1.59	4.29	1.49
Taking blood pressure as screening procedure	4.21	4.59	1.01	3.69	2.95*	4.35	1.34
Teaching diabetic patient to inject insulin	4.20	4.38	1.18	3.84	1.85	4.38	1.18
Lab blood test for chemistry	4.17	4.50	0.80	3.98	1.84	4.02	1.81
Dietary counseling	4.14	4.47	1.14	3.67	2.26	4.27	0.93

TABLE 1 (continued)
Activity Rating Means and Variances by Respondent Group

<i>Activity</i>	<i>Grand X</i>	<i>Administrators</i>		<i>Directors</i>		<i>Physicians</i>	
		<i>X</i>	<i>δ²</i>	<i>X</i>	<i>δ²</i>	<i>X</i>	<i>δ²</i>
Simple diagnostic x-ray	4.11	4.41	0.76	3.93	1.99	4.00	2.13
Sickle cell test as screening procedure	4.09	4.53	0.76	3.71	3.05*	4.02	1.93
Family planning counseling	4.06	4.50	1.20	3.76	2.68	3.91	2.08
Eye examination as screening for glaucoma	4.02	4.41	1.01	4.05	2.09	3.58	2.33
IUD insertion	4.00	4.18	1.40	4.25	1.15	3.57	2.42
Family counseling	3.97	4.18	1.28	3.63	2.34	4.10	1.46
EKG	3.96	3.81	0.83	3.88	1.57	4.19	1.64
Examination of the teeth	3.93	4.12	1.74	3.83	2.11	3.83	2.18
Sputum culture	3.91	3.88	1.24	3.71	2.25	4.15	1.57
Blood culture	3.90	4.00	1.25	3.81	2.26	3.88	1.94
Incision and drainage of abscess	3.86	3.71	1.60	4.13	1.97	3.75	2.45
Routine physical examination for insurance purposes	3.83	3.76	2.19	3.53	2.66	4.19	2.03
Wart removal	3.81	3.71	2.35	4.04	2.00	3.70	2.08
Development evaluation of children	3.76	4.00	1.50	3.55	2.36	3.74	2.02
Suturing	3.72	3.59	1.38	3.98	2.05	3.60	2.51
VD contact follow-up	3.72	4.06	1.81	3.60	2.91*	3.50	2.64
Teaching rehabilitative exercises	3.60	4.00	1.50	3.40	2.17	3.38	1.81
Densitizing injection for allergy	3.56	3.41	1.88	3.66	1.94	3.60	2.16
Marital counseling	3.55	3.63	2.12	3.12	2.46	3.92	1.48
Vital statistics reporting	3.43	3.63	3.05*	2.98	3.68*	3.80	2.69
Aspiration of joint	3.36	3.00	2.25	3.63	2.49	3.46	2.70
Cast removal	3.36	3.29	1.72	3.38	2.27	3.40	2.25
Excision of minor lump	3.24	2.76	1.94	3.59	2.95*	3.38	3.02*
Incision and drainage of thrombosed hemorrhoid	3.22	2.47	2.26	3.43	3.13*	3.75	2.40
Sigmoidoscopy	3.22	2.53	2.51	3.35	2.86*	3.77	2.39
Cast application	3.11	2.94	2.43	3.24	2.75*	3.15	2.55
Delivery of infant	3.09	2.65	2.74*	3.10	3.88*	3.52	2.57
Manipulation of joint	2.96	2.94	2.68	3.36	2.09	2.60	2.51
Dental treatment	2.96	2.88	3.24*	3.48	2.89*	2.51	2.82*
Determining eligibility for Medicaid and Medicare	2.85	2.76	2.94*	2.20	2.32	3.59	2.85*
X-ray contrast study	2.39	1.88	1.86	2.82	2.69	2.48	2.68
D and C	2.37	1.88	1.36	2.97	3.44*	2.28	2.51
Appendectomy	2.01	1.47	1.76	2.66	3.77*	1.89	2.31

*Activity judgments with high variance

within the patient examination category, activities that fall outside the operational definition of primary care include examination of the teeth, routine insurance examinations, developmental examination of children, and sigmoidoscopy. Within the category of laboratory procedures, EKGs, blood cultures, sputum cultures and x-ray contrast studies were not considered primary care.

Within the category of treatment procedures, 13 activities were considered primary care, and 20 activities were not. This latter group included appendectomy, D and C, joint manipulation, joint aspiration, cast application, delivery of infants, dental treatment, marital counseling, and teaching rehabilitative exercises.

Between-group differences. The appropriate multivariate analysis of between-groups differences necessitated some data reduction. A principal components analysis was therefore undertaken on the set of 59 activities. This analysis makes no assumptions regarding the underlying structure of the variables but simply creates linear composite variables that account for a greater proportion of the variance in fewer variables. Eighty-five respondents (69% of the total) had no missing data and were employed in this analysis.

TABLE 2
Activities with High Between-Groups Disagreement

Activity	Factor Loading*	Mean Ratings		
		Administrators	Directors	Physicians
Pap smear	.865	4.71	4.12	4.58
Testing vision	.863	4.65	3.74	4.39
Taking blood pressure as screening procedure	.843	4.59	3.69	4.35
Sickle cell test as screening procedure	.833	4.53	3.71	4.02
Urinalysis	.831	4.76	4.02	4.56
Breast examination as screening procedure	.830	4.63	3.76	4.46
Well baby care	.830	4.53	3.88	4.51
Taking patient's history	.826	4.82	4.00	4.72
TB skin test	.813	4.59	3.84	4.55
Lab blood test for hematology	.807	4.76	4.17	4.50
Microscopic exam of urine	.805	4.31	4.09	4.46

*Activities with factor loadings on the first principal component > .800 are included.

Five principal components, collectively accounting for 66% of the variance of the original 59 variables, were rotated (varimax criterion) and employed to create factor scores. These five scores per respondent were then subjected to a multivariate analysis of variance to test for overall group differences. This test was nonsignificant ($F(10, 156) = 1.14$), indicating that the grand mean for each activity may be considered representative for each of the three respondent groups.

It should be noted, however, that these data do suggest some group differences. The first principal component (accounting for the most variance, in this case 37%) showed a significant effect of group membership ($F(2, 82) = 3.34, p < 0.04$). Specifically, an apparent difference exists between the administrators and physicians as a group and the health department directors. Table 2 presents types of activities to which these groups respond differently.

For these 11 items, the means of the directors' responses were consistently smaller than those of the administrators and physicians. These activities appear to have some common characteristics. Several are concerned with screening, including Pap smear, testing vision, blood pressure testing, sickle-cell testing, breast examination, well baby care, and TB skin test. Such preventive activities historically have been associated with one of the more traditional roles of local health departments and thus may suffer from being labeled "preventive care" rather than "primary care". A comparison of all director responses with those of the other two groups suggest that certain other activities are not considered primary care because of their being identified with other established programs. Nutritional counseling, for example, is funded, in many health departments, for categorical funds such as the Special Supplemental Food Program for Women, Infants, and Children.

Within-groups differences. Consideration of the rating variances within respondent groups is also revealing. The 20 group-activity judgments with the highest variances are marked in Table 1 by an asterisk (*). With respect to group differences, note that 13 of the entries are included because of ratings by the health department directors. Health department directors are in fact disproportionately represented ($\chi^2(2) = 9.10, p < 0.011$), suggesting that as a group they agree less than do the other two groups in defining activities on the primary care scale. This may be due either to the wide range of training backgrounds among health directors or to less frequent contact with peers or to both.

Five activities showed relatively high variances (>2.7) for two or more groups of respondents. These included delivery of infant, vital statistics reporting, dental treatment, excision of minor lump, and determining Medicare and Medicaid eligibility. Activities with relatively high variances may be interpreted as the most controversial.

If an *agreed-upon* definition of primary care is desired, activities with high variances for any of the three respondent groups should not be included. Three of the 14 activities with the highest variances would be included in a

definition of primary care encompassing those activities with grand means greater than 4.0. These three—testing vision, taking blood pressure as screening procedure, and sickle cell test as screening procedure—are all variably rated by the Health department directors but exhibit high homogeneity in ratings among the state administrators and the primary care physicians. Whether these activities are sufficiently “agreed upon” is a moot point. Deciding if a definition of primary care is inclusive enough must lie with the researcher or practitioner using the definition.

CONCLUSIONS

This study represents an attempt to define primary care empirically in terms of selected health service activities. Since decision criteria are necessarily arbitrary, this paper has presented the information necessary for researchers and practitioners to put into operation a service definition of whatever breadth desired. The present analysis indicates that differences among the groups are not substantial, although health department directors apparently view screening activities differently from the other respondents in this study. Some services (identifiable by their high variances) are not well agreed upon even within respondent groups. These activities must be considered carefully if a widely acceptable definition of primary care is to be constructed.

These findings have several implications. First, because regional differences and the types of respondent group may influence the selection of activities considered to be “primary care,” the approach outlined here should be useful in program planning efforts involving various provider groups. The approach provides a mechanism for establishing the components of an operational definition of primary care at the onset of the program planning process. This specificity will force provider groups substantively to confront critical health service issues as well as their own value differences and will thus provide an opportunity for the real organizational change required in the health system to occur.

Second, with respect to research, the approach outlined here should be repeated with other provider groups, and in other areas of the country, so that regional and intergroup differences can be better described and understood. Other provider groups should include nurse practitioners, nurses, and clinicians working in various types of practice settings (e.g., clinic practice, HMO, university- and hospital-based clinics). In addition, the approach provides the opportunity to contrast provider expectations with those of consumers. This is particularly important, given the increasing role of consumers in health policy formulation.

Finally, the approach provides the basis for evaluating primary care service. Activities clearly designated as primary care by selected provider

groups may now be selected as the dependent variables in the evaluation process and measured in term of cost, time, and utilization. This degree of specificity will enhance the evaluation efforts among health service providers. This is extremely important, since evaluation is part of an expanding movement for accountability, and since primary care is increasingly considered the major vehicle for assuring access to comprehensive health care.

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